



Inventory and Monitoring Plan

Swan Lake National Wildlife Refuge



Waterfowl concentration in a managed wetland at Swan Lake National Wildlife Refuge.

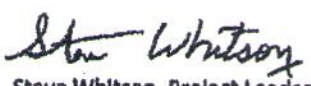
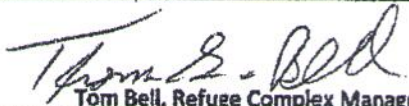
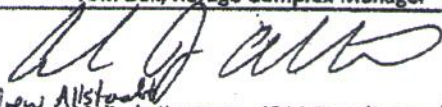
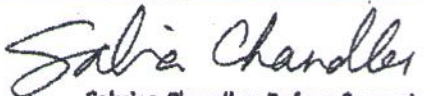
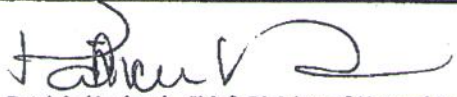

Photo credit: Zebadiah Yoko

January 2018



**Swan Lake National Wildlife Refuge
Inventory and Monitoring Plan**

Signature Page¹

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¹ Signatures apply to all contents of the IMP.

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Introduction

Located in Chariton County, Missouri Swan Lake National Wildlife Refuge (NWR) encompasses over 11,000 acres of bottomland forest, grasslands, and wetlands. Dominated by two large lakes, Silver Lake and Swan Lake, the Refuge also supports marsh, expansive bottomland forests, grasslands, and shrub swamp. Maintaining and enhancing moist-soil wetlands, emergent marsh, and bottomland forests to facilitate use by migratory birds are the top three priorities for Swan Lake NWR's habitat management efforts (Habitat Management Plan [HMP], USFWS 2017). Swan Lake NWR was created under mandates from five legislative authorities: "... as a refuge and breeding ground for migratory birds and other wildlife: ...", Executive Order 7563, dated Feb. 27, 1937, "... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds...", 16 U.S.C. - 715d (Migratory Bird Conservation Act) and "...particular value in carrying out the national migratory bird management program.", 16 U.S.C. - 667b (An Act Authorizing the Transfer of Certain Real Property for Wildlife).

This inventory and monitoring plan (IMP) documents the inventory and monitoring surveys that will be conducted at the Swan Lake National Wildlife Refuge from 2018 through 2033, or until the Comprehensive Conservation Plan (CCP, USFWS 2011) and HMP (2017) are revised. The majority of surveys considered in this plan address resource management objectives identified in the HMP (2017) for this refuge. The refuge HMP identified 8 broad habitat types and 22 priority species associated with these habitats (see Appendix A). Other surveys are a continuation of past monitoring conducted for the purpose of understanding long-term trends in specific resources or are part of regional and national survey efforts. This IMP was developed according to the Inventory and Monitoring (I&M) policy (701 FW 2) for the National Wildlife Refuge System.

The Environmental Conservation Online System (ECOS) database lists the Indiana bat and the interior least tern as Endangered and present on the refuge and the bald eagle as In Recovery and present on the refuge. 1000 acres of the refuge designated as the yellow creek research natural area set aside a Silver Maple-American Elm forest where "natural processes are allowed to predominate without human intervention".

Methods

Station staff generated a list of extant and anticipated surveys by generating a list of all observational efforts to gather information on refuge resources, including surveys specifically requested by FWS Migratory Birds, Ecological Services, or the State of Missouri. Least Tern surveys were not included because there are no known recent nesting records in central Missouri and occasional migrating terns could be documented via the waterbird survey. Although several surveys targeting bottomland communities could overlap with the yellow creek research natural area, no surveys specific to this portion of the refuge were identified. This extensive list was later refined to exclude general observations (reconnaissance) of refuge resources that do not require protocols or data management. The remaining surveys were then assigned a priority score using 17 pre-defined criteria (Appendix B). Priority scores were used to assign the survey to one of three groups that ranked the surveys (Appendix C).

Prioritizing and Selecting Surveys

The priority ranking of surveys was determined during a one-day (20 November 2013) meeting at the Swan Lake NWR office. Project Leader Steve Whitson met with Region 3 Zone Biologists Brian Loges and Pauline Drobney to prioritize and select the surveys. Background information for each survey was summarized in advance by Steve Whitson and Caroline Ward and briefly discussed prior to prioritizing the surveys. The 17 criteria, assignment rules, weighting and score calculation process followed the *Criteria for Prioritizing Surveys Entered into the PRIMR Database* (Appendix B). The two refuge staff made all decisions required to produce the survey priority scores (Appendix C) and select surveys for implementation.

Estimating Capacity

A cost-benefit analysis (Appendix D) was performed to evaluate the total return of potential sets of selected surveys over the life of the IMP. To determine a budget threshold, staff responsible for completing natural resource surveys were asked to estimate the portion of their time in a typical year dedicated to the following: analysis and summary, data management, monitoring, research, and supervision. The portions of the year dedicated to the activities required for implementing surveys were converted to weeks. Swan Lake NWR has a small staff, with the manager and maintenance worker potentially available for surveys; one biotech FTE is vacant. The estimate of weeks available for surveys was 15.3.

The time required to implement an annual iteration of a survey was also estimated using past experiences with established protocols or anticipated commitment for protocols that have yet to be developed. Since the portfolios were developed to document the total benefit of a set of surveys over the life of the IMP, the exercise was useful in identifying low frequency surveys with high cost efficiencies. Balancing the required commitment of the selected surveys with the resources available to the station at the time of the selection will increase the probability of survey implementation. Estimated annual costs for implementing surveys are documented in Appendix E.

Results: Selected Surveys

The prioritization and cost benefit analysis were used to inform the selection of surveys to be completed over the life of the IMP. In addition to the priority scores, the level of effort required to complete a survey as well as input from Region 3 Migratory Birds Division and Rock Island Ecological Services was considered in the selection process. Selected surveys include surveys identified for completion with FY2017 levels of staffing and support (Table 1). The list of surveys selected for implementation with existing resources represents a commitment to implementation by refuge staff. Changes in available capacity, CCP/HMP objectives, or other factors that alter the list of selected surveys through addition or removal of selected surveys will trigger a revision of this IMP (701 FW 2) and updates to the PRIMR database.

The prioritization process identified 7 surveys than can be completed with current staffing levels and budget for the duration of this Inventory and Monitoring Plan (IMP) (Table 1). Incorporating time estimates from the cost benefit exercise with an estimated .5 weeks for tracking management actions, the selected surveys will take approximately 14.6 weeks to implement in a typical year. Water level surveys (FF03RSWL00-33) were selected and combined with Integrated Waterbird Monitoring and Management (IWMM) (migration season) or Hydrology Monitoring (summer). Bat surveys were the only high priority survey not selected. The surveys in this section are needed to support high priority station HMP objectives, national survey efforts or other high priority plans (e.g. Recovery Plans), to evaluate the effectiveness of major or costly management actions, or to assess and address major threats to the biological integrity, diversity, or environmental health of the refuge. Surveys are organized and presented in order of perceived importance to refuge staff.

With regard to federally listed Threatened and Endangered Species, least terns are rarely seen on the refuge (no current nesting). Indiana bat surveys require fully trained and permitted staff and can be expensive when completed on a contract basis. Assuming presence and implementing BMPs to avoid impacts while conducting management activities will reduce the need for most bat surveys. An estimated annual work schedule for selected surveys is shown in Appendix F, and non-selected surveys are listed in Appendix G. Survey names were updated after the ranking exercise based on national and regional lists of standardized names and available protocols. A Refuge Condition Summary, a reporting tool to summarize status, trends, and desired conditions of the selected surveys, is provided in Appendix H. Environmental Action Statement requirements are addressed in Appendix I.

Box 1. Brief rationale for selected surveys

Survey Name	Rationale
Waterbird Surveys (IWMM)	The Integrated Waterbird Management and Monitoring Initiative (IWMM) combines waterbird counts with water level surveys and habitat assessments. Data are used to assess status of habitat management goals and objectives and effectiveness of management outcomes.
Hydrology Monitoring	Clarifies the Silver Lake water balance and other water related information needs as recommended by The Water Resource Inventory and Assessment (WRIA) (Stack 2016). Needed to defend future water rights issues and ensure availability of water resources to manage refuge wetlands.
Invasive Plant Survey	The results of the survey will be used to help prioritize the treatment of invasive species to maintain or improve habitat per HMP objectives.
Marshbird Surveys	Data are used to assess status of habitat management goals and objectives and effectiveness of management outcomes.
Contaminants Testing	USFWS policy requirements.
Deer Spotlight Survey	High profile species for human dimension issues. Data relate to deer harvest quotas as submitted to Missouri Department of Conservation for managed deer hunts.
Management Actions	This survey documents habitat restoration activities completed by refuge staff by fiscal year.

Table 1. Surveys selected for conduct at Swan Lake National Wildlife Refuge 2018—2032.

Survey Priority ¹	Survey ID Number ² (FF03R_)	Survey Name/(Type) ³	Survey Status ⁴	Mgmt. Objective Id ⁵	Survey Area ⁶	Staff Time (FTE) ⁷	Avg. Ann Cost (OPR) ⁸	Survey Timing ⁹	Survey Length ¹⁰	Survey Coord. ¹¹	Protocol	
											Citation ¹²	Status ¹³
1	037	Integrated Waterbird Management and Monitoring Initiative (CM)	Current	HMP / Pg. 69	Multiple management units	FWS: 0.06	\$300	spring and fall migration/ Recurring - every year	2016-Indefinite	Steve Whitson, Refuge Manager	Loges et. al. 2015	National Approved
2	006	Hydrology Monitoring (CM)	Current	HMP / Pg. 78	Regional	FWS: 0.02	\$500	Bi-monthly/ Recurring - every year	2010-2029	Josh Eash, Regional Hydrologist	(none)	Initial Survey Instructions
4	029	Invasive Plant Survey (M)	Current	HMP / Pg. 78	Entire station	FWS: 0.08	\$500	Spring and Summer/ Recurring - every year	2018-Indefinite	Steve Whitson, Refuge Manager	(none)	Initial Survey Instructions
6	010	Marshbird Surveys (CB)	Current	HMP / Pg. 71	Regional	FWS: 0.04	\$250	Spring & Fall migration/ Recurring - every year	2000-Indefinite	Steve Whitson, Refuge Manager	Conway 2015	National
7	030	Contaminants Testing (CB)	Current	CCP: Objective 1-8	Regional	N/A	\$0	Sporadic or Ad Hoc	2000-Indefinite	Steve Whitson, Refuge Manager	(none)	Initial Survey Instructions
18	004	Deer Spotlight Survey (M)	Current	NA	Regional	FWS: 0.01	\$125	Fall/ Recurring - every year	2000-Indefinite	Steve Whitson, Refuge Manager	(none)	Initial Survey Instructions

Survey Priority ¹	Survey ID Number ² (FF03R_)	Survey Name/(Type) ³	Survey Status ⁴	Mgmt. Objective Id ⁵	Survey Area ⁶	Staff Time (FTE) ⁷	Avg. Ann Cost (OPR) ⁸	Survey Timing ⁹	Survey Length ¹⁰	Survey Coord. ¹¹	Protocol	
											Citation ¹²	Status ¹³
NR	070	Management Actions (M)	Current	HMP / Pg. 69-81	Entire station	FWS: 0.01	\$0.00	December/Recurring - every year	2018-2032	(none)	(none)	Initial Survey Instructions

¹ The rank for each survey listed in order of priority (e.g., numeric, tiered, alpha-numeric, or combination of these).

² A unique identification number consisting of refuge code-computer assigned sequential number. Refuge code comes from the FBMS cost center identifier.

³ Short titles for the survey name, preferably the same name used in refuge work plans. Also include the PRIMR code for survey type in parentheses. These are: Inventory (I), Cooperative Baseline Monitoring (CB), Monitoring to Inform Management (M), Cooperative Monitoring to Inform Management (CM), Research (R), and Cooperative Research (CR).

⁴ Selected surveys planned for the lifespan of this IMP (i.e., Current, Expected).

⁵ The management plan and objectives that justify the selected survey.

⁶ Refuge management unit names, entire refuge, or names of other landscape units included in survey.

⁷ Estimates of Service (FWS) and non-Service (Other) staff time needed to complete the survey (1 work year = 2080 hours = 1 FTE).

⁸ Estimates of average annual operations cost for conducting the survey during the years it is conducted (e.g., equipment, contracts, travel) but not including staff time.

⁹ Timing and frequency of survey field activities.

¹⁰ The years during which the survey is conducted.

¹¹ The name and position of the survey coordinator (the Refuge Biologist or other designated Service employee) for each survey.

¹² Title, author, and version of the survey protocol (if there is no protocol to cite, enter None).

¹³ Scale of intended use (Site-specific, Regional, or National) and stage of approval (Initial Survey Instructions, Complete Draft, In Review, or Approved) of the survey protocol.

Narratives for Selected Surveys

Survey: Integrated Waterbird Monitoring and Management (IWMM) (*FF03RSWL00-037*)

Refuge: *Swan Lake National Wildlife Refuge*

Priority: *1*

Which station management objective does the survey support? Is the objective derived from the CCP, interim objectives, HMP, or other?

Over the 15-year life of the plan, refuge staff will annually provide between 900 to 2,000 acres of seasonally flooded mudflat, early successional vegetation, and invertebrate forage for waterfowl, shorebirds, and marshbirds migration periods towards meeting the retention goal of 15,550 emergent wetland acres in Missouri's BCR 22 as identified in the 2017 UMRGLJV waterfowl strategy. (HMP page 69).

Why is it important to conduct the survey? Describe how survey results will be used to make better informed refuge management decisions. If survey results are used to trigger a management response, identify the management response and threshold value for comparison to survey results.

The Integrated Waterbird Management and Monitoring Initiative protocol records bird use, water levels, vegetation, and management activities at the management unit scale. The data may be used to generate unit specific use-day estimates, document migration chronologies, and explore relationships between count data and habitat condition. Data summaries will guide state dependent decision making at the unit scale, such as choosing a soil disturbance prescription or a seasonal flood regime. Data can be used to assess the efficacy of management actions (accounting for management costs in terms of use-days for targeted populations) and support learning to improve management. Raw count data is also used to answer public inquiries regarding refuge-wide waterfowl populations. IWMM is supported by an online database that stores, manages, and reports waterbird, habitat, and management action data as a thematic node of the Avian Knowledge Network (AKN). The standardized protocol and database ensures refuge data is available for a wider range of analysis opportunities.

The survey is also important for monitoring water-levels within managed units. Water level data will be used in conjunction with data from surveys of migratory waterfowl, shorebirds, and other wildlife to determine the most appropriate hydrology for achieving water-level related HMP objectives.

What is the population or attribute of interest, what will be measured, and when?

Biological Integrity; Other Biota; Aves (Birds); Plantae (plants); Suliformes (Cormorants); Gruiformes (Rails, Cranes); Podicipediformes (Grebes); Anseriformes (Waterfowl, Swans, Ducks, Geese, Screamers); Gaviiformes (Loons); Pelecaniformes (Pelicans, Ibises, Herons); Charadriiformes (Gulls, Plovers, Alcids, Shore Birds, Auks, Oystercatchers); Recurring -- every year;

This survey involves direct counts or estimates of waterbirds, site condition assessments, vegetation assessments, and management actions tracking for managed wetland units.

Is this a cooperative survey? If so, what partners are involved in the survey?

Coop Monitoring to Inform Management; U.S. Fish and Wildlife Service, Migratory Birds

Survey: *Hydrology Monitoring (FF03RSWL00-006)*

Refuge: *Swan Lake National Wildlife Refuge*

Priority: 2

Which station management objective does the survey support? Is the objective derived from the CCP, interim objectives, HMP, or other?

In 11 out of 15 years, refuge staff will manage water levels within Silver Lake primarily to meet the annual migration period water demand, September 1st – January 1st, for dependent refuge wetlands. Within this role, increase Silver Lake's biological integrity by managing water levels to create or maintain a diverse mixture of aquatic and emergent wetland plants. Maintain resting habitat to sustain an annual average of bird use days per acre for priority refuge resources such as bald eagle (between 0.3 and 3), mallard (between 50 and 350), and canvasback (between 0.3 and 2). (HMP page 78)

Why is it important to conduct the survey? Describe how survey results will be used to make better informed refuge management decisions. If survey results are used to trigger a management response, identify the management response and threshold value for comparison to survey results.

This survey monitors surface waters that affect Refuge hydrology (e.g. stage, stream flow, volume) including seasonal inflow variations within Elk Creek and Turkey Creek. The survey is important to monitoring the hydrology of water sources that feed in and out of the refuge, which influences habitat and wildlife use in wetlands, lakes, and rivers. Data will help determine the capacity of Silver Lake as a water source for achieving wetland management objectives. Water rights may be issues that come up in future years and this data will be critical to defending future water usage rights.

What is the population or attribute of interest, what will be measured, and when?

Water volume and flow in tributaries and outlets. Turkey Creek, Elk Creek, and Silver lake stage.
Recurring -- every year; Bi-monthly

Is this a cooperative survey? If so, what partners are involved in the survey?

Yes. Region 3 Refuges Division of Natural Resources and Conservation Planning's Water Resources Branch provides equipment, technician time, and technical support necessary to implement the survey. Jennifer Gruetzman, Hydrologist, is the survey coordinator.

Survey: *Invasive Plant Survey (FF03RSWL00-029)*
Refuge: *Swan Lake National Wildlife Refuge*
Priority: 4

Which station management objective does the survey support? Is the objective derived from the CCP, interim objectives, HMP, or other?

Over the life of the HMP, refuge staff will annually sustain and enhance a minimum of 1,000 acres of grassland across the refuge to provide breeding and migratory stopover needs for refuge priority resources. Support priority resources such as grasshopper sparrow at a 15 year average density of 0.35 birds per acre and sedge wren at 0.2 birds per acre of suitable habitat during the breeding season. Grasslands will also provide for the full life cycle requirements of the western massasauga rattlesnake by supporting a range of 24-42% juveniles in assessment years. All grasslands will sustain a total vegetated cover of over 90 percent herbaceous species. Vegetation will be enhanced to promote a dominance of native vegetation such as bluestems, Indian grass, and other warm-season grasses in dry-mesic prairie, as well as prairie cordgrass, rushes, and sedges in wet-mesic prairie. Cover of invasive, exotic species will be reduced by at least 10 percent across managed grassland over the course of the plan. (HMP page 78).

Why is it important to conduct the survey? Describe how survey results will be used to make better informed refuge management decisions. If survey results are used to trigger a management response, identify the management response and threshold value for comparison to survey results.

The survey is important to identify and characterize invasive species populations on the refuge, particularly the early detection of new populations of invasive species. The results of the survey will be used to help prioritize the treatment of invasive species to maintain or improve habitat per HMP objectives.

What is the population or attribute of interest, what will be measured, and when?

Biological Integrity; Invasive Species; Plantae (plants); Fabaceae (peas, legumes); Poaceae (grasses);
Recurring -- every year; Spring and Summer

Is this a cooperative survey? If so, what partners are involved in the survey?

NO

Survey: *Marshbird Surveys (FF03RSWL00-010)*

Refuge: *Swan Lake National Wildlife Refuge*

Priority: 6

Which station management objective does the survey support? Is the objective derived from the CCP, interim objectives, HMP, or other?

Over the 15-year life of the plan, refuge staff will annually provide between 700 and 1500 acres of seasonally or semi-permanently flooded emergent wetlands dominated (>50% cover) by a mixture of native emergent, floating leaved, or submersed wetland plants to provide forage and cover during migration and nesting seasons for waterfowl, marshbirds, wading birds, and other wetland-dependent migratory birds. (HMP page 71)

Why is it important to conduct the survey? Describe how survey results will be used to make better informed refuge management decisions. If survey results are used to trigger a management response, identify the management response and threshold value for comparison to survey results.

The survey is important to document marshbird density and occupancy within intensively managed habitats on the refuge. It is part of a statewide marshbird monitoring program. Data from this survey will inform moist soil and perennial emergent marsh management activities at the refuge and contribute to assessment of marshbird abundance and occupancy at the state and regional levels.

What is the population or attribute of interest, what will be measured, and when?

Biological Integrity; Other Biota; Aves (Birds); Gruiformes (cranes, rails, coots); Podicipediformes (Grebes);

Is this a cooperative survey? If so, what partners are involved in the survey?

Missouri Department of Conservation. Missouri River Bird Observatory, USFWS Migratory Birds.

Survey: *Contaminants Testing (FF03RSWL00-030)*

Refuge: *Swan Lake National Wildlife Refuge*

Priority: 7

Which station management objective does the survey support? Is the objective derived from the CCP, interim objectives, HMP, or other?

CCP: Objective 1-8 Watershed Conservation;

Why is it important to conduct the survey? Describe how survey results will be used to make better informed refuge management decisions. If survey results are used to trigger a management response, identify the management response and threshold value for comparison to survey results.

These surveys are conducted periodically by Ecological Services staff. A Contaminant Assessment Process (CAP) was conducted for this Refuge in 1993, 2005, and most recently in 2011. Since the 1993 CAP survey, there have been changes in agricultural practices in the watershed. Confined animal facility operations have become more prevalent in the watershed and pesticide applications for row-crop production have changed. The effects of these changes should be monitored. They provide baseline data as to the effects of potential contaminants on refuge lands from hunting and farming activities as well as potential effects of off refuge contamination sources.

What is the population or attribute of interest, what will be measured, and when?

The 1993 Swan Lake NWR Contaminants Survey documented potential contamination problems from dieldrin, chlordane, copper, chromium, manganese, and zinc on the Refuge.

Is this a cooperative survey? If so, what partners are involved in the survey?

Yes. FWS Ecological Services & Environmental Contaminants

Survey: *Deer Spotlight Survey (FF03RSWL00-004)*

Refuge: *Swan Lake National Wildlife Refuge*

Priority: *18*

Which station management objective does the survey support? Is the objective derived from the CCP, interim objectives, HMP, or other?

None

Why is it important to conduct the survey? Describe how survey results will be used to make better informed refuge management decisions. If survey results are used to trigger a management response, identify the management response and threshold value for comparison to survey results.

This survey in conjunction with the deer harvest records and Chronic Wasting Disease (CWD) monitoring are used as a part of the Refuge deer management program that is responsive to public interest in this high-profile recreational species.

What is the population or attribute of interest, what will be measured, and when?

Biological Integrity; Other Biota; *Odocoileus virginianus* (White-tailed Deer, white-tailed deer);
Recurring -- every year; Fall

Is this a cooperative survey? If so, what partners are involved in the survey?

NO

Survey: Management Actions (FF03-070)
Refuge: Swan Lake National Wildlife Refuge
Priority: Not Ranked

Which station management objective does the survey support? Is the objective derived from the CCP, interim objectives, HMP, or other?

Multiple HMP objectives: Wetlands, grasslands, Savanna, and bottomland forests (HMP pages 69-81).

Why is it important to conduct the survey? Describe how survey results will be used to make better informed refuge management decisions. If survey results are used to trigger a management response, identify the management response and threshold value for comparison to survey results.

This survey documents habitat restoration activities completed by refuge staff for the current fiscal year. The survey is also retroactive capturing available legacy management actions completed by the refuge or by other entities prior to refuge acquisition. Current fiscal year activities will be organized by annual work plans while legacy information existing in multiple forms will be archived as part of an on-going effort by the Division of Natural Resources and Conservation Planning to secure management history of refuge properties in ServCat. Information will be collected at the greatest available detail required to inform future assessments of long term habitat restorations.

What is the population or attribute of interest, what will be measured, and when?

Recurring -- every year; December

Is this a cooperative survey? If so, what partners are involved in the survey?

No

Revising the IMP

The Project Leader will review the refuge capacity and status of surveys annually and determine which of the selected surveys will be implemented in that year. The PRIMR database was updated along with this IMP; it will be updated as approved protocols are linked to the selected surveys and when surveys are added or removed from the set of selected surveys.

The IMP will be revised according to I&M Policy and as CCP and HMP plans are modified (see Appendix J). An IMP revision is triggered when surveys are added or removed from the set of selected surveys. IMP revisions require signatures from refuge staff, Regional I&M staff, Regional Refuge Biologist/Natural Resources Division Chief, but not the Refuge Supervisor or Regional Chief of Refuges.

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Appendix A. Priority Resources of Concern with associated habitat types and federally listed Threatened or Endangered Species.

Swan Lake NWR Priority Resources of Concern; derived from Table 3-3 in HMP (2017). Priority habitats indicated by italics, red text, and rank ordered numbers.

Resource of Concern	<i>Bottomland Forest (3)</i>	Shrub Swamp / Early Successional Forest	<i>Perennial Emergent Wetlands (2)</i>	<i>Moist-soil Units (1)</i>	Grassland	Savanna	Riverine	Silver Lake
Bald Eagle							x	
Black Tern			x					
Blue-winged teal				x				
Canada Goose			x	x				
Canvasback								x
Grasshopper Sparrow					x			
Greater Yellowlegs				x				
Indiana Bat	x							
King Rail			x					
Lesser Scaup			x					
Mallard			x	x				x
Massasauga					x			
Northern Harrier					x			
Prothonotary Warbler		x						
Red-headed Woodpecker	x					x		
River Otter							x	
Sedge Wren					x			
Sora				x				
Wood Duck	x	x					x	
Yellow-billed Cuckoo						x		

Federally listed Threatened or Endangered Species

Species	Status
Indiana bat (<i>Myotis sodalis</i>)	Endangered
Bald eagle (<i>Haliaeetus leucocephalus</i>)	Recovery
Northern long-eared bat (<i>Myotis septentrionalis</i>)	Threatened with 4(d) Rule
Least Tern (Interior Population) (<i>Sterna antillarum</i>)	Endangered

Appendix B. Criteria and Weights Used to Prioritize Surveys

The following 17 criteria were weighted by refuge staff at Swan Lake NWR and used to prioritize surveys through a Simple Multi-Attribute Rating Technique (SMART tool). Please note that these criteria were in draft form at the time of prioritization. The current tool (PRIMR prioritization tool) and criteria (*Criteria for Prioritizing Surveys Entered into the PRIMR Database*) can be downloaded [here](#).

- 1) **Station purpose:** Does the survey provide information to evaluate if the station is achieving its purpose(s)?
Note: Refuge purpose is defined in Appendix 1. A survey addressing wilderness character addresses purpose for a station with proposed or designed wilderness.
 1. No
 2. Yes
- 2) **Other legal mandates:** Does the survey provide information to evaluate whether or not the station is addressing legal mandates besides refuge purposes such as Biological Integrity, Diversity, and Environmental Health (BIDEH); NWR Resources of Concern (e.g., migratory birds, anadromous fishes, marine mammals); maintaining water rights; and compatibility of refuge uses especially wildlife-dependent recreation?
Note: Federally listed species are addressed under criterion #7 so they should not be considered as a NWR Resources of Concern under this criterion. For BIDEH, only consider surveys addressing the highest measure of biological integrity, which is viewed as those intact and self-sustaining habitats and wildlife populations existing during historic conditions (see 601 FW 3.10). Example 1: Because 99% of the wet prairie habitat has been lost throughout the Willamette Valley, remnant prairie on WL Finley NWR represents the highest order of BIDEH on the refuge where habitat monitoring is a priority survey. Example 2: The refuge staff at Muscatatuck NWR is currently preparing its hunt plan where monitoring the population of white-tailed deer during the hunting season on refuge would inform this plan.
 1. No
 2. Yes
- 3) **Large investment in management actions:** Does the survey inform whether or not the station is achieving one or more CCP, HMP, or other management plan objectives involving management actions requiring substantial expenditure of funding and staff time?
Example: If conducting wetland management actions requires considerable staff time and funding annually, then surveys that evaluate response of vegetation and waterfowl to wetland management actions could be considered a high priority.
 1. No
 2. Yes
- 4) **Controversy:** Does the survey support decision making to assess a suspected or known controversial refuge management action, refuge use, or species?
Note: Terms are defined in Appendix 1. Examples of suspected or known controversial refuge management actions include mammalian predator control and use of pesticides. Examples of suspected or known controversial refuge uses (recreational and economic) can include establishing new close areas from waterfowl hunting, opening a refuge to white-tailed deer hunting, use of genetically modified crops, and livestock grazing.
 1. No
 2. Yes
- 5) **Known or suspected threats:** Will the survey provide information to potentially reduce the duration of the threat(s) to the station, cost to the station due to those threat(s), or effect station resources of concern due to those threat(s) during the current or future CCP planning cycles?

Examples of known or suspected threats include the following: proposed water withdrawal within the station's watershed, a new invasive species, impacts of proposed development, combinations of threats such as increased fire cycles promoting invasive species, and man-made and natural disasters (e.g., hazardous spills, hurricanes).

1. The survey does not address threat(s)
 2. Low: The survey potentially informs 1 of 3 factors (duration, cost, or effect on resources)
 3. Medium: The survey potentially informs 2 of 3 factors (duration, cost, or effect on resources)
 4. High: The survey potentially informs all 3 factors (duration, cost, and effect on resources)
- 6) **Baseline data:** Does the survey provide high-priority information that contributes to baseline data needs? *Example: Inventories of species guilds (e.g., invertebrates, plants, reptiles) or abiotics (soils, waters).*
1. No
 2. Yes
- 7) **Species or vegetation community with a listing status:** Is the species or vegetation community (the focus of the survey) federally listed under ESA, state listed (threatened or endangered only), ranked by the state's natural heritage program (S1 or S2 rank only), globally ranked by NatureServe (G1 or G2 rank only), or globally listed on the IUCN Red List of Threatened Species (Critically Endangered, Endangered, or Vulnerable only)?
Example 1: An inventory of small mammals where one or more of the species likely or suspected to be found on the refuge is state or globally listed. Example 2: Surveys of abiotic factors affecting species should be considered under this criterion. Monitoring water quality parameters in wetlands inhabited by state-listed aquatic birds to assess potential effects to avian species.
1. Not state or federally listed nor globally ranked
 2. State listed or ranked by state's natural heritage program
 3. Globally listed only (G1 or G2)
 4. Federally listed (Endangered, Threatened, or Candidate)
- 8) **FWS priorities:** Does the survey provide information that directly contributes to evaluating the status and trends of resources that are a priority for the NWRS or other FWS regional or national program (e.g., Migratory Birds, Fisheries, T&E species, Water Resources/Hydrology) or the national I&M initiative (e.g., phenology, baseline inventories, water quality)?
Example 1: North American Breeding Bird Survey, Woodcock Singing Ground Counts, North American Amphibian Monitoring Program, Mid-Winter Waterfowl Survey, and Circumpolar Biodiversity Monitoring Network are priority surveys for regional or national FWS programs. Example 2: A survey to determine the status and trends of a federally listed landbird species would be a priority for both the Migratory Birds and T&E Species programs.
1. Does not address a management priority identified by a FWS regional or national program or initiative
 2. Addresses a management priority identified by 1 FWS regional or national program or initiative
 3. Addresses a management priority identified by 2 FWS regional or national programs or initiatives
 4. Addresses a management priority identified by ≥ 3 FWS regional or national programs or initiatives
- 9) **Survey coverage for species or vegetation community:** What proportion (%) of the species' (sub) population or vegetation communities' geographic range under U.S. jurisdiction will be covered by the survey on the station?
Example 1: 75% of Laysan Albatross population nest on Midway NWR. Conducting a survey to monitor the breeding population size on the refuge would cover >10% of the entire species' population and score 3.

Note: Surveys of abiotic factors affecting these species or vegetation communities should also be considered for this criterion. Example 2: 60% of the wintering waterfowl in the Pacific Flyway use wetlands in the Central Valley of California including the San Luis NWRC. Monitoring water levels by reading staff gauges weekly from October to March in managed wetlands is an important abiotic survey to indicate if there are sufficient acres of suitable foraging habitat to support 60% of the wintering waterfowl. Because water is essential to maintain refuge wetlands for wintering waterfowl, “survey coverage” would equate to waterfowl population surveys and score 3.

1. Low: Survey covers <1% of the species’ or communities’ population/range
2. Medium: Survey covers 1-10% of the species’ or communities’ population/range
3. High: Survey covers ≥10% of the species’ or communities’ population/range

10) Survey utility: How many station CCP, HMP, or other management plan objectives can be evaluated by the survey?

Example 1: A survey of staff gauge readings for water levels in representative units can be used to evaluate a range of wetland habitat objectives including seasonal, emergent, and permanent types. Example 2: An Early Detection Rapid Response survey can be used to discover the presence of highly invasive plant species in multiple refuge habitats.

1. Does not address an objective
2. Addresses 1 objective
3. Addresses 2 objectives
4. Addresses 3 or more objectives

11) Survey leveraging: Is the survey conducted or integrated with one or more other surveys? Applies to multiple stations and/or on/off refuge property.

Note: This criterion applies to surveys that were designed to be conducted in conjunction with each other in order to fully evaluate the status and trends of the target resource and its habitat. Example 1: The landbird point count protocol requires habitat parameters be collected in conjunction with avian data. Example 2: Habitat parameters and avian population counts are collected for the Integrated Waterbird Management and Monitoring project.

1. Survey is not integrated with other surveys
2. Survey is integrated with 1 other survey
3. Survey is integrated with >1 other surveys

12) FWS partners: Does the survey address high or medium priorities of relevant Landscape Conservation Cooperatives (LCC), state agencies, or other conservation partners?

1. Does not address a management priority identified by FWS partners (e.g., LCC, state agency).
2. Addresses a management priority identified by 1 FWS partner (e.g., LCC, state agency).
3. Addresses a management priority identified by 2 FWS partners (e.g., LCC, state agency).
4. Addresses a management priority identified by ≥3 FWS partners (e.g., LCC, state agency).

13) Cooperative surveys: At what scale does the survey most benefit the science information needs required for resource management?

Note: Only surveys with a standard protocol and established systems of data management and analysis are scored higher than a 1. Terms are defined in the Appendix. This criterion is applicable to surveys covering areas on and adjacent to the station. Example: If a refuge participates and contributes to a regional survey involving neighboring US Forest Service lands, then this criterion would apply.

1. Small scale: Applicable to only 1 refuge.
2. Medium scale: Applicable to a smaller group of refuges or single refuge complex.
3. Large scale: Applicable to multiple refuges/complexes across an entire ecoregion, LCC, or region.

4. Continental scale: Component of a large landscape level survey (e.g., North American Breeding Bird Survey, Woodcock Singing Ground Counts, North American Amphibian Monitoring Program, and Circumpolar Biodiversity Monitoring Network).

14) **Survey duration:** Over what time scale will the objective(s) addressed by the survey need to be evaluated?

Note: Long-term surveys will need to be consistently implemented over multiple generations of the species or successional stages of habitat to evaluate achievement of objective(s).

1. Short-term: 1-15 years
2. Long-term: >15 years.

15) **Cost of data collection, analysis, and reporting:** What is the cost (e.g., staff time, contractor cost, equipment, sample analysis/processing, annual funding) for survey design, implementation, data management, data analysis, and reporting?

Note: Surveys requiring novel techniques, many repeated visits or large numbers of staff will likely be more expensive to implement. Similarly, surveys requiring assistance for the development of protocols and analysis of data will be more costly. Conversely, if a standardized protocol, database, analysis, and/or reporting system are available, then the costs of implementing such a survey may be much lower than if these elements must be designed and tested upfront. Also, consider partners (e.g., universities), who assist or fully implement surveys, as a basis for estimating costs.

1. High: >5% of annual funding or staff time for the refuge biological program is dedicated to the survey
2. Medium: 1-5% of annual funding or staff time for the refuge biological program is dedicated to the survey
3. Low: 0.1- 1% of annual funding or staff time for the refuge biological program is dedicated to the survey
4. Very Low: <0.1% of annual funding or staff time dedicated for the refuge biological program is dedicated to the survey

16) **Data analysis:** Are the survey data analyzed for use at the station level?

Note: The frequency and intensity of management is dependent upon station objectives. In some cases, baseline inventory or monitoring is appropriate if active management is not anticipated for the foreseeable future. In contrast, monitoring to detect threshold conditions or for adaptive management may be needed to maintain certain habitats (e.g., moist-soil wetlands) requiring considerable, annual management activities to achieve desired conditions.

1. None: Study design does not allow data to be analyzed
2. Low: Data have not been analyzed but they are available for analysis
3. Medium: Data can/have been analyzed on infrequent basis
4. High: Data can/have been analyzed on regular basis

17) **Data use:** Are the survey results reported and used to inform current and future management decisions?

Note: See description from criterion #15.

1. None: Study design does not allow results to be readily reported. Therefore, results are not used in management decisions.
2. Low: Data have not been analyzed but are available for reporting so they may be used to inform management at the refuge(s).
3. Medium: Results can/have been reported, but these results have not been used to guide management at the station, regional, or larger landscape levels.
4. High: Currently reported on regular intervals and used to inform management at the refuge(s), regional, or larger landscape levels.

Terms Used in the Prioritization Criteria

For Criterion #1, refuge purpose is defined within the National Wildlife Refuge System Mission and Goals and Refuge Purposes policy (601 FW 1).

The NWRS Improvement Act defines “purposes of the refuge” as the “purposes specified in or derived from the law, proclamation, Executive order, agreement, public land order, donation document, or administrative memorandum establishing, authorizing, or expanding a refuge, refuge unit, or refuge subunit.”

Refuges acquired under the authority of general conservation laws take on the purpose of the law. Examples of such laws include the Endangered Species Act of 1973, as amended; the Migratory Bird Conservation Act; the Fish and Wildlife Act of 1956, as amended; the Fish and Wildlife Coordination Act, as amended; the Emergency Wetlands Resources Act of 1986; and the Alaska National Interest Lands Conservation Act of 1980. Executive orders and proclamations, Secretary’s Orders, public land orders, and refuge-specific legislation generally declare the purpose(s) of the refuge, sometimes broadly (e.g., “as a preserve and breeding ground for native birds”) and sometimes very specifically (e.g., “to protect and preserve in the national interest the Key deer and other wildlife resources in the Florida Keys”).

As written in the Wilderness Act of 1964, the purposes of the Act are to be “within and supplemental” to the purpose(s) of those refuges with designated wilderness. We interpret this to mean the wilderness purposes become additional purposes of the refuge, yet apply only to those areas of the refuge designated as wilderness. Wilderness designations provide additional considerations for determining the administrative and management actions we need to take to achieve a refuge’s purpose(s) on designated wilderness areas within the Refuge System.

Throughout the criteria, the term refuge refers to one or more refuges in the NWRS. Based upon 601 FW 1, a refuge is defined as “...all lands, waters, and interests therein administered by the Service as wildlife refuges, wildlife ranges, wildlife management areas, waterfowl production areas, and other areas managed by the Refuge System for the protection and conservation of fish and wildlife, including threatened and endangered species, as determined in writing by the Director of the Service, by Secretary’s Order, or so directed by the President.”

Definitions of refuge management activities and refuge uses derived from the Compatibility policy (603 FW 2.6) that apply to all refuges:

Table B1. Weight Applied to Prioritization Criteria.

The following 24 criteria were weighted by refuge staff at Swan Lake NWR (relative values in parentheses with highest values representing criteria that are most important to refuge staff) and used to rank surveys through a Simple Multi-Attribute Ranking Technique (SMART tool).

Ranking Criteria		Weight	Comparison to even weight
1	Station purpose	0.08	0.02
2	Other legal mandates	0.08	0.02
3	Large investment in management actions	0.06	0.00
4	Controversy	0.06	0.00
5	Known or suspected threats	0.06	0.00
6	Baseline data	0.08	0.02
7	Species or vegetation community non-federal listing status	0.08	0.02
8	FWS priorities	0.08	0.02
9	Survey coverage for species or vegetation community	0.06	0.00
10	Survey utility	0.08	0.02
11	Survey leveraging	0.04	-0.02
12	FWS partners	0.06	0.00
13	Survey spatial context	0.06	0.00
14	Survey duration	0.02	-0.04
15	Cost of data collection, analysis, and reporting	0.02	-0.04
16	Data analysis	0.06	0.00
17	Data use	0.06	0.00

Appendix C. Prioritization Scores of All Ranked Surveys

Values used to prioritize and select the surveys likely to be conducted through 2030 at Swan Lake National Wildlife Refuge. Prioritization scores were generated for candidate surveys by refuge staff using 24 criteria for each survey (Appendix A). Candidate surveys represent specific surveys or general information needs and were not always associated with specific protocols. Groups A, B, C, D, and A = >90th, >70th, >40th, and <40th percentiles respectively.

Table C-1. Ranking of priority scores from the SMART tool for all considered surveys.

Survey	Final Rank	Final Score	Group
Waterbird Surveys (IWMM)	1	0.654	A
Hydrology Monitoring	2	0.641	A
Bat Surveys	3	0.583	A
Invasive Plant Inventory	4	0.529	B
Proth. Warbler Density	5	0.526	B
Marshbird Surveys	6	0.503	B
Contaminants	7	0.481	B
Veg Community/Habitat Surveys	8	0.478	B
Wood Duck Banding	9	0.458	B
Water Level Surveys	10	0.413	C
King Rail Breeding Status	11	0.410	C
Silver & Swan Veg	12	0.391	C
Winter Raptor Survey	13	0.388	C
American Woodcock Fall Migration Ecology	14	0.369	C
Moist-Soil Survey	15	0.359	C
Rare Plant Survey	16	0.343	C
Botanical Inventory	17	0.314	C
Deer Spotlight Survey	18	0.308	C
Oak regen. surveys	19	0.260	D
Massasauga Survey	20	0.260	D
Reed Canary Grass ARM	21	0.237	D
Odonata Survey	22	0.179	D
Lepidoptera Survey	23	0.122	D
Turtle Study	24	0.109	D
Snake Inventory	25	0.109	D
Frog and Toad Breeding Survey	26	0.083	D
Mammal Inventory	27	0.083	D
Franklin's Ground Squirrel Survey	28	0.051	D

Appendix D. Cost-benefit Analysis

The following table includes results from direct selections and linear programming approaches (all optimized sets). The optimized portfolios used the total of all frequency adjusted scores as an objective function. Main constraints included costs (weeks) and surveys selected prior to solving the linear function (summation of frequency adjusted scores across all surveys). Portfolios represent sets of selected surveys as IMP variants.

Table D-1. Parameters framing IMP portfolios presented in table D-2.

Portfolio	Parameters
1	Top-down selection from ranked list
2	Top 10 selection
3	All surveys selected
4	Optimized for maximum benefit
5	Optimized constrained to group A*
6	Optimized constrained to group A & wood duck*
7	Optimized constrained to groups A & B*
8	Final selected set

*See Table C-1 for group definitions.

Table D-2. Efficiencies in terms of frequency adjusted total benefit for 18 potential IMP portfolios. Portfolios (x= selected surveys) were created by direct selections or by solving for optimal sets (maximum benefit within constraints) as described in table D-1. Benefit scores are derived from the ranking results presented in table C-1. At the time of the ranking workshop 15.3 weeks per year were estimated as available. The estimated was applied as a constraint in portfolios 1,4,5, & 6.

Survey Name	1	2	3	4	5	6	7	8
American Woodcock		x	x	x	x	x		
Bat Surveys	x	x	x	x	x	x	x	
Botanical Inventory		x	x	x	x	x		
Contaminants	x	x	x	x	x	x	x	x
Deer Spotlight Survey		x	x		x	x		x
Franklin's Ground Squirrel Survey		x	x					
Frog and Toad Breeding Survey		x	x					
Hydrology Monitoring	x	x	x		x	x	x	x
Invasive Plant Inventory	x	x	x	x			x	x
King Rail Breeding Status		x	x					
Lepidoptera Survey			x					
Mammal Inventory			x					
Marshbird Surveys			x	x			x	x
Massasauga Survey			x					
Moist-Soil Survey			x					
Oak regen. surveys			x	x		x		
Odonata Survey			x	x				
Proth. Warbler Density	x		x	x	x	x	x	
Rare Plant Survey			x	x	x	x		
Reed Canary Grass ARM			x					
Silver & Swan Veg			x					
Snake Inventory			x					
Turtle Study			x					
Veg Community/Habitat Surveys			x	x	x		x	
Water Level Surveys			x					
Waterbird Surveys	x		x		x	x	x	x
Winter Raptor Survey			x	x	x	x		
Wood Duck Banding	x		x			x	x	
Benefit	2.0	2.2	3.1	2.6	2.5	2.5	2.2	1.8
Weeks/year	15.3	11.5	39.4	15.2	15.2	15.2	19.3	14.1
# Surveys	7	10	28	12	11	12	9	6

Appendix E. Estimated Annual Costs for Implementing Surveys

(Surveys with historic status are excluded).

Survey Name	Survey ID Number	Survey Priority	Survey Status	FWS Staff Total	Total Cost
Bat Surveys with Mist Net and Anabat	FF03RSWL00-003	3	Future	\$962	\$3,385
Contaminants Testing	FF03RSWL00-030	7	Current	\$0	\$0
Deer Spotlight Survey	FF03RSWL00-004	18	Current	\$769	\$894
Franklin's Ground Squirrel Survey	FF03RSWL00-014	28	Future	\$48	\$48
Frog and Toad Breeding Survey	FF03RSWL00-015	26	Future	\$48	\$48
Habitat/Plant Community Surveys	FF03RSWL00-036	8	Future	\$3,846	\$4,046
Hydrology Monitoring	FF03RSWL00-006	2	Current	\$2,308	\$2,808
Invasive Plant Survey	FF03RSWL00-029	4	Current	\$7,692	\$8,192
King Rail Survey	FF03RSWL00-034	11	Future	\$3,846	\$4,096
Mammal Inventory	FF03RSWL00-025	27	Future	\$1,923	\$1,923
Management Actions	FF03RSWL00-070	NR	Current	\$1010	\$1010
Marshbird Surveys	FF03RSWL00-010	6	Current	\$3,846	\$4,096
Massasauga Survey	FF03RSWL00-001	20	Future	\$3,846	\$4,346
Moist Soil Survey	FF03RSWL00-019	15	Future	\$1,923	\$2,048
Oak Regeneration Survey	FF03RSWL00-032	19	Future	\$1,923	\$2,048
Prothonotary Warbler Density Survey	FF03RSWL00-035	5	Future	\$3,846	\$4,346
Rare Plant Survey	FF03RSWL00-021	16	Future	\$1,923	\$3,923
Silver Lake and Swan Lake Vegetation Survey	FF03RSWL00-031	12	Future	\$1,923	\$2,023
Snake Inventory	FF03RSWL00-024	25	Future	\$1,923	\$1,923
Water Level Surveys	FF03RSWL00-033	10	Current	\$7,692	\$8,192
Waterbird Surveys	FF03RSWL00-002	1	Current	\$4,808	\$5,058
Wood Duck Banding	FF03RSWL00-028	9	Future	\$1,923	\$1,923
				Staff Total	Total Cost
Total for selected (current and expected) surveys:				\$19,423	\$21,048
Total for future surveys:				\$37,980	\$44,703

Appendix F. Estimated Annual Work Schedule for Selected Surveys, January - December

Survey Name	Survey ID Number (FF03RSWL00-)	Survey Priority	Jan-March	April-June	July-Sept	Oct-Dec
Integrated Waterbird Monitoring and Management (IWMM)	037	1	FW,DE,A,R	FW,DE,P	FW,DE	FW,DE
Hydrology Monitoring	006	2	FW,DE,A,R	FW,DE	FW,DE	FW,DE
Invasive Plant Survey	029	4	A,R	FW,DE	FW,DE	A,R
Marshbird Surveys	010	6		FW		FW,DE, A,R
Contaminants Testing	030	7				FW,A,D E,R
Deer Spotlight Survey	004	18				FW,DE, A,R
Management Actions	070	NR	FW,DE	FW,DE	FW,DE	FW,DE, A,R

P=Planning, T=Training, FW=Field Work, DE=Data Entry, A=Analysis, R=Reporting

Appendix G. Non-selected Surveys

A status of future denotes surveys that have been prioritized but have low chance of being conducted during the span of the IMP because of low priority or because the capacity to conduct the survey will be difficult to secure. Historic status surveys have been recently completed or discontinued and were not ranked.

Survey Name	Survey ID Number	Survey Priority	Survey Status
Aerial Waterfowl Survey	FF03RSWL00-005	~	Historic
American Woodcock Fall Migration Ecology	FF03RSWL00-018	~	Historic
Audubon Big Sit	FF03RSWL00-007	~	Historic
Audubon Christmas Bird Count	FF03RSWL00-008	~	Historic
Avian Influenza Testing	FF03RSWL00-012	~	Historic
Bat Surveys with Mist Net and Anabat	FF03RSWL00-003	3	Future
Botanical Inventory	FF03RSWL00-026	~	Historic
Chronic Wasting Disease Testing	FF03RSWL00-011	~	Historic
Eastern Massasauga Hibernating Ecology and Effects of Burning	FF03RSWL00-017	~	Historic
Franklin's Ground Squirrel Survey	FF03RSWL00-014	28	Future
Frog and Toad Breeding Survey	FF03RSWL00-015	26	Future
Habitat/Plant Community Surveys	FF03RSWL00-036	8	Future
King Rail Survey	FF03RSWL00-034	11	Future
Lepidoptera Survey	FF03RSWL00-013	~	Historic
Mammal Inventory	FF03RSWL00-025	27	Future
Massasauga Survey	FF03RSWL00-001	20	Future
Moist Soil Survey	FF03RSWL00-019	15	Future
Oak Regeneration Survey	FF03RSWL00-032	19	Future
Odonata Survey	FF03RSWL00-027	~	Historic
Prothonotary Warbler Density Survey	FF03RSWL00-035	5	Future
Rare Plant Survey	FF03RSWL00-021	16	Future
Reed Canary Grass Monitoring	FF03RSWL00-009	21	Historic
River Otter Survey	FF03RSWL00-016	~	Historic
Shorebird Survey	FF03RSWL00-023	~	Historic
Silver Lake and Swan Lake Vegetation Survey	FF03RSWL00-031	12	Future
Snake Inventory	FF03RSWL00-024	25	Future
Turtle Survey	FF03RSWL00-020	~	Historic
Winter Raptor Survey	FF03RSWL00-022	~	Future
Wood Duck Banding	FF03RSWL00-028	9	Future

Appendix H. Refuge Condition Summaries

Revisions and improvements to this table are **CURRENTLY UNDER DEVELOPMENT**. Once improvements are completed all IMPs will include this appendix in their IMPs. This summary table will be used as a reporting tool throughout the life of the IMP to track the status, trends, and desired conditions of the selected surveys. Updates to this summary can be made during annual reviews and reported in Annual Habitat Work Plans (AHWP). Table updates will not require an IMP revision, but will be uploaded as a digital file associated with the ServCat record that contains the approved IMP.

REFUGE SUMMARY TABLE - Swan Lake NWR

Resource Theme Level 1 ¹	Resource Theme Level 2 ¹	Attribute ²	Current Condition (values) ³	Source of Current Condition ⁴	Desired Condition (values) ⁵	Source of Desired Condition ⁶	Within Desired Condition? ⁷	Survey Name ⁸

¹ Level 1 and 2 refer to the PRIMR Resource Themes 1 and 2 and cannot be altered.

² Characteristics of a system that are of interest of survey and can be observed or estimated.

³ If known, current conditions of system being measured.

⁴ Document in which current condition is reported. If not available enter "unknown" or "N/A".

⁵ Desired conditions of system being measured.

⁶ Document in which desired condition is reported. If not available enter "unknown" or "N/A".

⁸ Survey name should match PRIMR record.

Appendix I. Environmental Action Statement (EAS)

Within the spirit and intent of the Council on Environmental Quality's regulations for implementing the National Environmental Policy Act (NEPA) (40 CFR 1500-1508), and other statutes, orders, and policies that protect fish and wildlife resources, I have established the following administrative record and determined that the following proposed action does not require additional NEPA documentation.

Proposed Action, Alternatives, and NEPA Documentation

The proposed action is to implement an Inventory and Monitoring Plan (IMP) for the Swan Lake National Wildlife Refuge. This IMP is a refinement of the 2011 Comprehensive Conservation Plan (CCP) and associated Environmental Assessment (EA) for the Refuge. This IMP provides more-specific guidance for surveys of Refuge's fish, wildlife, plant, habitat, and abiotic resources to fulfill the Refuge's purposes and help achieve Refuge's goals and objectives.

The EA for the Swan Lake National Wildlife Refuge CCP included goals and objectives for the refuge and assessed the impacts associated with a range of reasonable alternatives to achieve those goals and objectives. The rationale for selection of one specific alternative for implementation is explained in the Finding of No Significant Impact (FONSI) accompanying the final CCP. The goals, objectives, and survey strategies included in this IMP fall within the bounds of those described and assessed in the CCP and EA or EIS.

Pursuant to 40 CFR 1502.9, no additional NEPA documentation is required to implement this IMP beyond the EA and FONSI prepared concurrently with the CCP. No substantial changes to the proposed action alternative that was identified, analyzed, and selected for implementation within the CCP, EA, and FONSI are proposed through this IMP. Similarly, no significant new information or circumstances exist relevant to environmental concerns and bearing on the proposed action or its impacts.

In accordance with 43 CFR 46.205 and 40 CFR 1508.4, some surveys within this IMP are covered by the following Departmental categorical exclusion because they would not have significant environmental effects.

“Research, inventory, and information collection activities directly related to the conservation of fish and wildlife resources which involve negligible animal mortality or habitat destruction, no introduction of contaminants, or no introduction of organisms not indigenous to the affected ecosystem.” 516 DM 8.5B(1)

Project Leader/Refuge Manager

Date

[Note: this signature and dating is not required if a statement is placed below the IMP signature page indicating that the Project Leaders signing of that page applies to all contents of this IMP].

Reference: U.S. Fish and Wildlife Service. 2011. *Comprehensive Conservation Plan and Environmental Assessment for Swan Lake National Wildlife Refuge*. USFWS Region 3. Bloomington MN.

Appendix J. IMP Revision Signature Page

An IMP will be revised according to I&M Policy and as CCP and HMP plans are modified. IMP revisions require signatures from the staff listed in table below, which does not include the Refuge Supervisor or Regional Chief of Refuges. A revised IMP will include the completed and signed Revision Signature Page which will be placed at the beginning of the IMP and before the original signed IMP signature page.

IMP Revisions Swan Lake National Wildlife Refuge		
<i>Action</i>	<i>Signature /Printed Name</i>	<i>Date</i>
Survey list and priority changed:		
Submitted By:	Refuge Manager/Project Leader	
Reviewed By:	Regional I&M Coordinator	
Approved By:	Refuge Supervisor	